

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

CLASS: B.TECH.
BRANCH: EEE

SEMESTER: VII
SESSION : MO/2022

SUBJECT : EE593 HIGH VOLTAGE ENGINEERING

TIME: 02 Hrs.

FULL MARKS: 25

INSTRUCTIONS:

- 1 The total marks of the questions are 25.
 2. Candidates attempt for all 25 marks.
 3. Before attempting the question paper, be sure that you have got the correct question paper.
 4. The missing data, if any, may be assumed suitably.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q1	(a) What are the different types of voltages occurring in high voltage practice? [2]	1	1
	(b) Explain the two essential conditions to be satisfied for a collision of an electron with an atom to be an ionizing one. [3]	1	2
Q2	Explain the processes of breakdown in electronegative gases. [5]	3	4
Q3	In an experiment in a certain gas, the steady state current is 5.5×10^{-8} A at 8kV at a distance of 0.4 cm between the plane electrodes. Keeping the field constant and reducing the distance to 0.1cm result in a current of 5.5×10^{-9} A. Calculate Townsend's primary ionization coefficient. If the breakdown occurred when the gap distance was increased to 0.9cm, what is the value of Townsend's secondary ionization coefficient? [5]	1, 3	4
Q4	(a) What is Paschen's law? [2]	3,4	1
	(b) What is meant by the withstand strength of an insulation? Are the withstand strength and breakdown strength constant for an insulating material? [3]	1,2,4	2
Q5	What is a vacuum? How is it categorized? What is the usual range of vacuum used in high voltage apparatus? What are the factors affecting the breakdown voltage of a vacuum gap? [5]	1, 3	2

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